

Obesity is dramatically on the rise now and it is the major risk factor for a number of chronic diseases, including type 2 diabetes. In 1997 in Geneva World Health Organization (WHO) declared Obesity a global epidemic with major health implication. The health implications of this epidemic are profound. Diabetes mellitus type 2, insulin resistance, cardiovascular disease, nonalcoholic steatohepatitis, hypertension, sleep disturbances including obstructive sleep apnea are the most common complications associated with the civilization disease. Problems with the etiology, clinical characteristics and potential treatment strategies for obesity and diabetes type 2 (T2DM) are some of the most intensively studied and the most widely discussed areas within the biomedical sciences. The task faced by experimental medicine and biology is the search and characterization of mechanism associated with these disorders. In recent years there are more and more reports about the discovery of peptides involved in the regulation of energy homeostasis of the organism at both the central nervous system and in many peripheral tissues. One of them is spexin, the peptide was discovered in 2007.

Spexin also known as neuropeptide Q is a peptide involved in regulation of food intake, body mass and adipose tissue metabolism. Still is little known about functions of spexin. However, in 2015 Gu et al demonstrated that spexin could be involved in pathogenesis of T2DM. Results showed correlation between plasma spexin and glucose, triglycerides and LDL cholesterol concentrations in patients with type 2 diabetes. The main objective of this project is to add the grain of knowledge about the potential influence of spexin on carbohydrate and lipid metabolism and hormonal profile in T2DM. Moreover, project is focused on characteristic of spexin effect on metabolism of isolated liver cells – hepatocytes. Moreover, research will result in the identification of intracellular signaling pathways activated by spexin.

Project is divided into two panels: *in vivo* and *in vitro*

*In vitro* panel will be conducted using isolated animal liver cells - hepatocytes and/or cell lines. The second part of experiments (*in vivo*) will be conducted on murine and rat model of type 2 diabetes. Using animal model will be investigated acute and long-term effect of intraperitoneal injection of spexin on metabolism and hormonal profile in T2DM.

Explanation of the spexin effect on metabolism in diabetes and understanding of its mechanisms of action may contribute in the future to its therapeutic use in these pathophysiological conditions. In addition, these studies will contribute to the development of knowledge about the effects of spexin on the metabolism and will allow for verification of a number of contrary reports about spexin action via GALR's.